

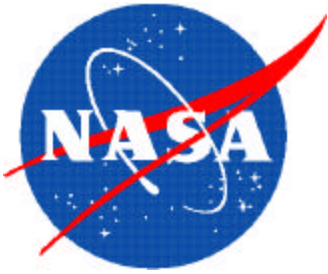
# ***NASA Balloon Program***

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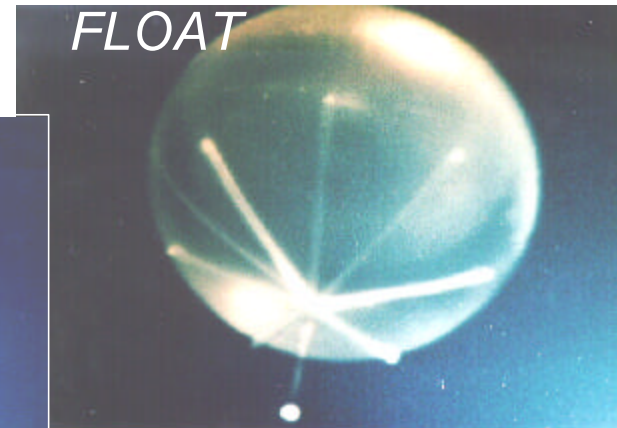
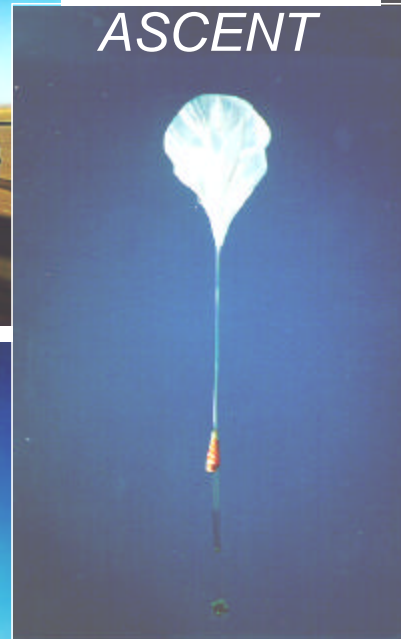
## **MIDEX OVERVIEW**

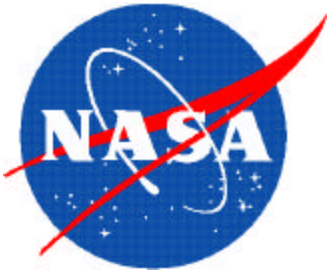


**LONG DURATION BALLOONS**



# ***NASA Balloon Program***





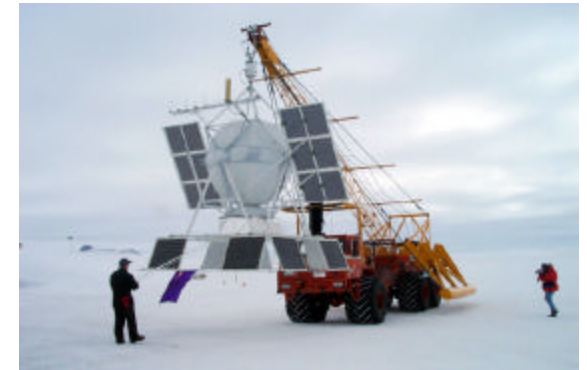
# ***NASA Balloon Program***



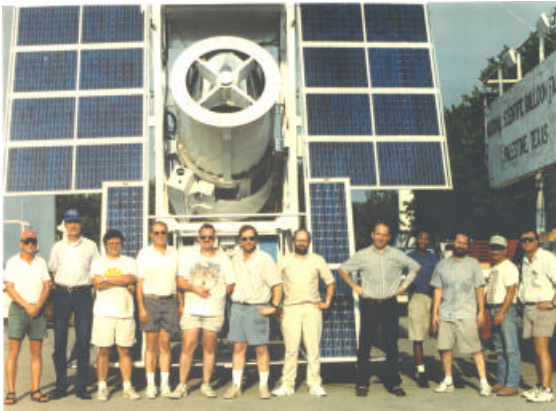
**Gamma-ray: HIREGS**



**CMB: Boomerang**



**Cosmic-Ray: ATIC**



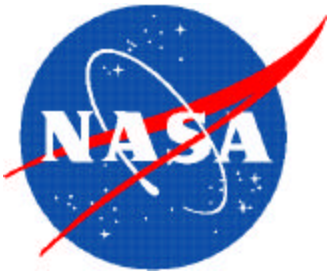
**Solar Physics: Flare Genesis**



**'97 Fairbanks Circumglobal  
Test Flight**

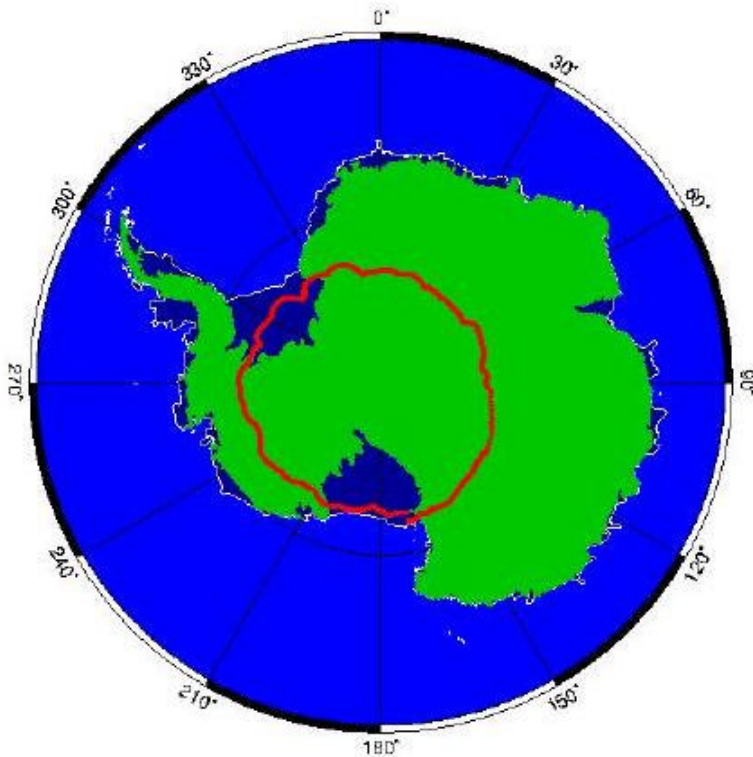
## ***LDB BALLOON PAYLOADS***



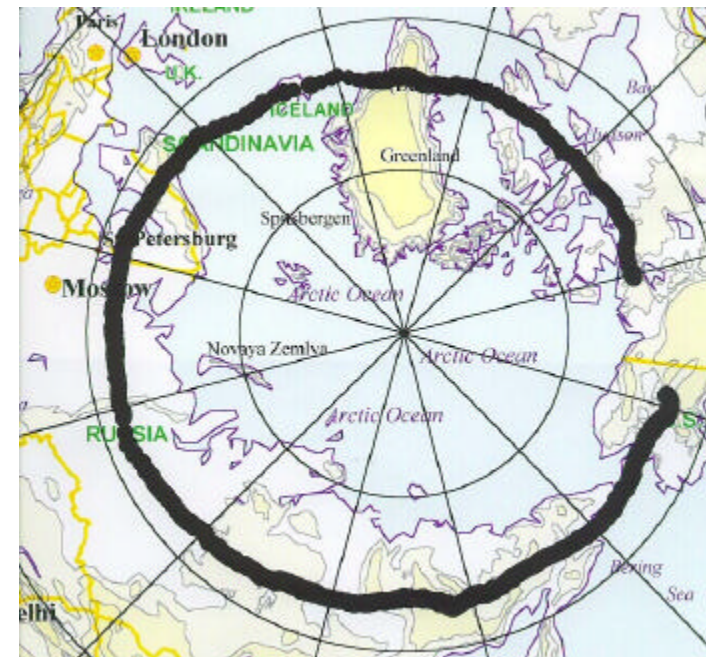


# ***NASA Balloon Program***

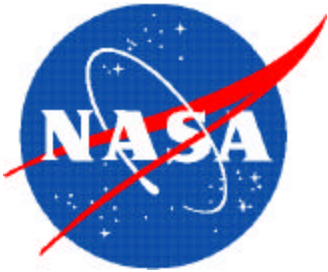
## ***LDB TRAJECTORIES***



McMurdo LDB 1/7/96  
19 DAYS



Fairbanks LDB 6/23/97  
12.7 DAYS



# ***NASA Balloon Program***

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## ***LDB HISTORY***

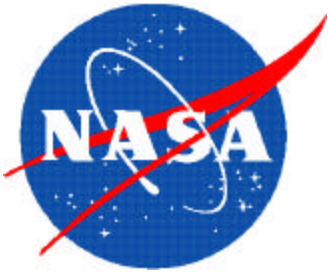
### **➤ LDB ANTARCTICA**

- 16 FULL CIRCUMPOLAR FLIGHTS SINCE 1990
- LONGEST FLIGHT: 26.8 DAYS / SHORTEST FLIGHT: 8.7 DAYS
- AVERAGE SINGLE CIRCUMPOLAR FLIGHT DURATION: 14.5 DAYS
- TYPICAL ALTITUDES OF 115KFT TO 130KFT / DIURNAL VARIATION  $\approx$  4KFT POSSIBLE\*

### **➤ LDB FAIRBANKS**

- 2 FULL CIRCUMGLOBAL FLIGHTS SINCE 1997
- LONGEST FLIGHT: 12.7 DAYS / SHORTEST FLIGHT: 12.6 DAYS
- ALTITUDES OF 107KFT TO 123KFT / DIURNAL VARIATION  $\approx$  8KFT POSSIBLE\*

\* DEPENDANT UPON BALLAST / SUSPENDED MASS CONFIGURATION AND EARTH FLUX



# ***NASA Balloon Program***

## ***ERRATA***

### **➤ MIDEX LIBRARY “LONG DURATION BALLOON OPPORTUNITIES”**

- LDB FLIGHT APPLICATION IS AVAILABLE OFF THE NSBF WEB SITE:

<http://master.nsbfn.nasa.gov/fred/docs.html>

- REFERENCES TO TELEMETRY RATES OF “KB” SHOULD READ AS “kbps”  
(kilobits per second)

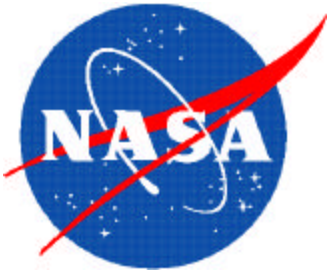
### **➤ DEVELOPMENT OF ENHANCED CAPABILITY FOR TDRSS TELEMETRY RATES**

- ULDB DEVELOPED TDRSS HIGH GAIN ANTENNA

- UP TO 150 kbps MA MODE, DEMONSTRATED IN STATIC GROUND TEST MODE
- OPERATED FLAWLESSLY ON ULDB BALLOONCRAFT TEST FLIGHT ON MAY 26, 2001 AT 50 kbps RATE USING MA MODE FOR 24+ HOUR FLIGHT
- OPERATED FLAWLESSLY ON ULDB BALLOONCRAFT TEST FLIGHT ON MAY 26, 2001 AT 150 kbps RATE USING MA MODE DURING TWO-TEN MINUTE EVENTS

- ULDB DEVELOPED TDRSS DATA INTERFACE GENERATED BER TEST  $< 10^{-6}$

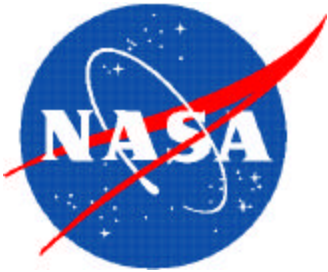
- REQUIRES IMPLEMENTATION AND TEST VERIFICATION INTEGRATED WITH LDB FLIGHT SUPPORT SYSTEMS



# ***NASA Balloon Program***

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**HAVE YOU CONSIDERED  
LONG DURATION BALLOONS?**



# ***NASA Balloon Program***

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- **LOWER OVERHEAD**
- **FEWER ORGANIZATIONAL INTERFACES**
- **SHORTER LEAD TIME TO FLIGHT**
- **HIGH PROBABILITY OF RECOVERY WITH MINIMAL DAMAGE TO INSTRUMENT**
- **MULTIPLE MISSIONS**
- **MISSION OF OPPORTUNITY**
- **TEST AND VERIFICATION PLATFORM FOR INSTRUMENT/PAYLOAD DEVELOPMENT**